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NEW SPECIES, VARIETIES AND COMBINATIONS FROM  
THE HERBARIUM AND THE COLLECTIONS OF  
THE ARNOLD ARBORETUM<sup>1</sup>

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*With nine text figures*

***Celtis Rockii***, sp. nov.

Arbor 6-metralis, ramulis hornotinis dense flave crispulo-villosis angulatis vel subangulatis lenticellatis, annotinis tarde glabrescentibus; gemmae ovoideae, acutae, perulis adpresse flavo-pilosis. Folia papyracea, elliptico- vel rhombico-ovata, 4-8 cm. longa et 2.3-4.5 cm. lata, breviter acuminata, basi plus minusve oblique late cuneata vel fere rotundata, a medio vel infra medium ad apicem dentato-serrata, supra accumbenti-pilosa et scabrida, subtus tota facie satis dense molliter crispulo-villosa, ad nervos pilis longioribus patentibus flavidis instructa, triplinervia, nervis utrinsecus basalibus inclusis 2-3; petioli flave crispulo-villosi, 3-5 mm. longi. Flores non visi. Racemi fructiferi axillares in parte inferiore ramulorum plerique triflori, pedicello terminali incluso 1-1.5 cm. longi, dense flave crispulo-villosi, pedunculo 2-5, pedicellis 3-8 mm. longis; drupa subglobosa, parva, plus minusve villosula, vel maturitate glabra vel fere glabra, lutea (ex collectore) in sicco atro-fusca; putamen subglobosum, circ. 4 mm. diam., manifeste punctulato-foveolatum et leviter costatum.

CHINA. Y u n n a n : region of Tungshan, Yangtze drainage basin, east of Likiang, *J. F. Rock*, no. 10522 (type), in 1923 (tree 20 ft.; fruits yellow).

This new species seems closely related to *C. Salvatiana* Schneid., and also to *C. cinnamomea* Lindl., but from both it is easily distinguished by the rather dense pubescence of the leaves, the densely pubescent branchlets and inflorescence and the pubescent fruit; from *C. cinnamomea* it differs further in the serrate broader leaves, the few-flowered short-peduncled inflorescence and smaller fruit.

<sup>1</sup>Continued from vol. XIII. 341.

***Clematis chinensis*** Osbeck, Dagb. Ostind. Resa, 205, 242 (1757); Reise Ostind. China, 267, 315 (1765); Voy. China East Ind. I. 329; II. 356 (1771).—Retzius, Observ. II. 18, t. 2 (1781).—De Candolle, Syst. I. 137 (1818); Prodr. I. 3 (1824).—Forbes in Jour. Bot. XXII. 262 (1884).—Hemsley in Jour. Linn. Soc. XXIII. 3 (1886).—Pritzel in Bot. Jahrb. XXIX. 332 (1900).—Finet & Gagnepain in Bull. Soc. Bot. France, L. 535 (1903); Contrib. Fl. As. Or. I. 20 (1905), excl. synonym. *C. terniflora* et *C. Benthamiana*.—Rehder & Wilson in Sargent, Pl. Wilson. I. 329 (1913); in Jour. Arnold Arb. VIII. 106 (1927).—Léveillé, Fl. Kouy-Tchéou, 332 (1915).—Merrill in Jour. Am. Bot. III. 579 (1916).—Rehder in Jour. Arnold Arb. X. 187 (1929).

*Clematis sinensis* Loureiro, Fl. Cochinch. 345 (1790).

*Clematis minor* Loureiro, l. c. (1790).—De Candolle, Syst. I. 136 (1818); Prodr. I. 3 (1824).—Forbes in Jour. Bot. XXII. 263 (1884).

*Clematis recta* § *chinensis* Kuntze in Verh. Bot. Ver. Brandenb. XXVI. 114 (Monog. Clem.) (1885).

*Clematis funebris* Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. XI. 168 (1902).

*Clematis oligocarpa* Léveillé & Vaniot, l. c. XVII. no. 210-11, p. ii (1907).—Léveillé, Fl. Kouy-Tchéou, 333 (1915).

*Clematis Cavaleriei* Léveillé & Porter in Fedde Rep. Spec. Nov. IX. 20 (1910).—Léveillé, Fl. Kouy-Tchéou, 332 (1915).

The fact that the generally accepted name *Clematis chinensis* Retzius would be invalidated by the older homonym *C. chinensis* Osbeck, if the two names referred to different species, has led me to investigate this question and I find that the two names are synonymous, as they have been already treated by a few authors. This will save the specific epithet *chinensis* for the species generally known under this name, and makes necessary the change of the author citation only, so that it will be *C. chinensis* Osbeck (1757) instead of Retzius (1781).

Owing to the fact that Osbeck's name was published with a rather incomplete description hidden away in the text of a work not primarily taxonomic, it has been neglected, while Retzius' name published with an adequate description accompanied by a plate has been universally accepted. Also the misleading citation in Index kewensis of *C. chinensis* Osbeck as a synonym of *C. recta* L. may have caused the disregard of the name by later authors. Moreover E. D. Merrill (l. c.) has tried to identify *C. chinensis* Retz. with *C. Meyeniana*, but the description given by Osbeck (l. c. p. 205) "Plurima habet communia Clematide Vitalba, at folia lanceolata, angustissima, & flores minores" agrees much better with *C. chinensis* Retz. which has pinnate leaves like *C. Vitalba* with narrower leaflets and decidedly smaller flowers, while *C. Meyeni-*

*ana* has ternate leaves with large subcoriaceous leaflets, quite different from the pinnate leaves of *C. Vitalba*, and flowers scarcely smaller than those of the latter species. Additional data given by Osbeck (l. c. p. 242) "Pistilla 3 ad 6, stylis plumosis in orbem positis reflexis. Stam. O obseruavi. Frutex scandens, ramosissimus" may apply as well to *C. chinensis* as to *C. Meyeniana*. In his more recent Commentary on Loureiro's Flora cochinchinensis (msc.), however, Merrill identifies *Clematis minor* Lour. with *C. chinensis* Osbeck and states that according to his opinion *C. chinensis* Retz. and *C. chinensis* Osbeck are identical; he also considers *C. Benthamiana* Hemsl. a synonym, following Finet & Gagnepain, which I keep separate (see Rehder & Wilson, l. c.).

The identity of *C. chinensis* of Osbeck and of Retzius is proven conclusively by specimens before me, for the loan of which I am indebted to those in charge of the herbarium of the State Museum in Stockholm. One of these specimens is marked on the back of the sheet "China: Osbeck," a second "Herb. Swartzii—Osbeck" and a third "ex Ind. Orient.," the last note may have reference to the fact that it was collected during Osbeck's East Indian voyages, but as the species does not occur in East India, the specimen probably came from China. All these specimens represent very early collections and were probably all collected by Osbeck; they are all named *Clematis chinensis* Retz., the determinations being apparently of a later date, for two of them bear the citation "DC." The specimens vary somewhat in the shape and size of the leaves and only one has leaflets as narrow and small as in Retzius' plate of *C. chinensis*.

*Clematis chinensis* is widely distributed in southeastern and central China extending west to Szechuan and Kweichou. In this herbarium there are specimens from the following provinces: Kwangtung, Fukien, Hunan, Anhwei, Chekiang, Kiangsi, Hupeh, Szechuan and Kweichou; there is also a specimen from Annam, and a photograph of the type of *C. minor* Lour. from Cochinchina.

***Clematis grata* Wall. var. *likiangensis*, var. nov.**

A typo recedit achaeniis glabris.—Ramuli, petioli et inflorescentiae laxe villosula. Foliola ovata, trilobata lobis grosse paucidentatis, supra glabrescentia, subtus in costa venisque densius, in venulis sparsius et in facie sparsissime flavido-pilosis; flores ut in typo carpellis glabris exceptis.

CHINA. Y u n n a n : Yangtze watershed, Prefectural district of Likiang, eastern slopes of Likiang Snow Range, *J. F. Rock*, nos. 3668 (type) and 3918.

*Clematis grata* apparently varies like the related *C. Gouriana* Roxb.,

and *C. brevicaudata* DC. with pubescent and glabrous akenes (*C. Gouriana* var. *Finetii* Rehd. & Wils. and *C. brevicaudata* var. *lissocarpa* and var. *subsericea* Rehd. & Wils.), which shows that the pubescence of the akenes is a character of secondary importance and cannot be used to define subdivisions of the genus.

***Deutzia Esquirolii*** (Lévl.), comb. nov.

*Styrax Esquirolii* Léveillé in Fedde Rep. Spec. Nov. ix. 446 (1911).

*Deutzia lancifolia* Rehder in Sargent, Pl. Wilson. i. 147 (1912); Jour. Arnold Arb. xii. 276 (1931).—Léveillé, Fl. Kouy-Tchéou, 387 (1915).

*Deutzia Chaffanjonii* Léveillé, l. c. (1915), pro synonym. *D. lancifoliae* Rehd.

*Deutzia Esquirolii* (Lévl.) Léveillé, l. c. (1915), pro synonym. *D. lancifoliae* Rehd.

When dealing with *D. lancifolia* in my Notes on the ligneous plants described by Léveillé (Jour. Arnold Arb. xii. 276) I overlooked that unfortunately Léveillé's *Styrax Esquirolii* is one year older than my *Deutzia lancifolia* and that the new combination resulting from the transfer of the specific epithet of his name should be the valid name for the species. Léveillé himself had already published this combination, but only as a synonym of *D. lancifolia*.

***Hydrangea umbellata*** Rehder in Sargent, Pl. Wilson. i. 25 (1911).

*Hydrangea Schindleri* Engler in Engler & Prantl, Nat. Pflanzenfam. ed. 2, xviii-A, 203 (1930), pro parte.—**Synon. nov.**

*Hydrangea Schindleri* was only briefly mentioned in Engler's account of the species of *Hydrangea* (l. c.) without enumeration of specimens. Engler compared it with *H. chinensis* Maxim. and *H. umbellata* Rehd. In the Berlin Herbarium there are four specimens labeled *H. Schindleri* all collected by A. K. Schindler in August-September 1908 at Lu-shan, Kuling mountains, Kiangsi, the type locality of *H. umbellata*. Two of them, nos. 325 and 327, I cannot distinguish from *H. umbellata* while the other two numbers belong to the following species:

***Hydrangea paniculata*** Siebold in Nov. Act. Acad. Leop.-Carol. xiv. pt. ii. 690 (Syn. Hydr.) (1829).

*Hydrangea Schindleri* Engler in Engler & Prantl, Nat. Pflanzenfam. ed. 2, xviii-A, 203 (1930), pro parte.—**Synon. nov.**

Of the four numbers collected by Schindler at Lu-shan, Kiangsi, and named by A. Engler *H. Schindleri* two belong to the preceding species, while the other two, nos. 322a and 324, are identical with *H. paniculata* Sieb. No. 324 bears the following note in A. Engler's handwriting, "Hydrangea Schindleri Engl. n. sp., affinis Hydr. chinensi Maxim., differt foliis ab infima triente sursum angustatis, haud e medio utrinque angustatis, distinctius serratis, florum sterilius sepalis ovatis angusti-

oribus." This seems to show that this specimen should be considered the type of *H. Schindleri* Engl., since the preceding characterization is apparently based on Schindler's no. 324 rather than on any of the other numbers and is the same as given in German in the Pflanzenfamilien.

In 1911 in my Synopsis of the Chinese species of *Hydrangea* (in Sargent, Pl. Wilson, 1. 25, 1911) I stated that Wilson's no. 1601, collected at Kuling, July 27, 1907, was to my knowledge the first specimen of *H. paniculata* collected in China. Since then, however, many additional specimens have come to this herbarium and the species is now known from the following Chinese provinces: **K i a n g s u**: Yii-du-hsien, *H. H. Hu*, no. 1179. **A n h w e i**: Chu-hwa-shan, *R. C. Ching*, no. 2808; Wu-yen, *N. K. Ip*, no. 7675. **C h e k i a n g**: Tsing-Tien, Taishun-hsien and Chang-shan-hsien, *Y. L. Keng*, nos. 172, 310 and 841; Pang-yung, *R. C. Ching*, no. 2099; East Tien-mu, *H. H. Hu*, no. 1609. **K i a n g s i**: Kuling, *E. H. Wilson*, no. 1601; Lu-shan (Kuling), *A. K. Schindler*, nos. 322a, 324; Lu-shan, *A. N. Steward*, no. 2613; Ningdu, *Wang-Te-Hui* in *Handel-Mazzetti*, Pl. Sin., no. 442. **F u k i e n**: Yenping, *H. H. Chung*, nos. 2844, 3301, 3556 and 3659. **K w a n g t u n g**: Lokchong, *Y. Tsiang*, no. 1219; between Bei-shen and Nan-shung, *W. Y. Chun*, no. 5683; road to Chang-kiang, *W. Y. Chung*, no. 5794; Siudsao, *R. Mell*, no. 1773. **H u n a n**: Wukang, *Handel-Mazzetti*, no. 12527. **K w e i c h o u**: Lou-tsong-koan, *E. Bodinier*, no. 1661; Kwei-yang, *Handel-Mazzetti*, no. 10478; Kweiting, *Y. Tsiang*, no. 5627. **Y u n n a n**: Yunnanfu, *O. Schoch*, no. 423. The specimen collected in 1897 by E. Bodinier in Kweichou was described by L veill  as *H. Kamienskii* (cf. Jour. Arnold Arb. XII. 277).

***Spiraea yunnanensis*** Franchet, Pl. Delavay. 200 (1890).—Schneider, Ill. Handl. Laubholz. I. 463 (1905).

*Spiraea sinobrahuica* W. W. Smith in Not. Bot. Gard. Edinb. x. 67 (1917); XIV. 233, 260 (1924); XVII. 388 (1930).—**Synon. nov.**

*Spiraea sinobrahuica* var. *aridicola* W. W. Smith in Not. Bot. Gard. Edinb. x. 68 (1917); XVII. 197, 363 (1930).—**Synon. nov.**

**CHINA.** **S z e c h u a n**: in valle fl. Ming, inter stationes Sim-puanj et Pei-schuy-tchan, *G. N. Potanin*, Aug. 25, 1873 (frutex usque metralis); inter Tatsien-lu et Batang, ad stationem Natschuka sive Nachtschuka, *V. Kashkarov*, May 19, 1893 (frutex plus quam metralis); between Batang and Tschien-lu, *John R. Muir*, in 1911; Muli kingdom, Shou-chu valley, alt. 2435-2900 m., *J. F. Rock*, no. 16279, June 1928. (shrub 1-1.5 m.) **Y u n n a n**: terrains calcaires, pierreux au dessus de Mo-so-yn, Lankong, alt. 2200 m. *J. Delavay*, no. 1082, (holotype of *S. yunnanensis*, photo. and fragments in A. A.), May 1,

1884 (arbrisseau d'un mètre; fleurs blanches); eastern flank of the Lichiang range, Lat.  $27^{\circ} 10' N.$ , alt. 9000-10500 ft., amongst the scrub in side valleys, *G. Forrest*, no. 5580 (syntype of *S. sinobrahuica*; ex W. W. Smith, l. c.); descent of the Yangtze from the eastern boundary of the Lichiang valley, lat.  $27^{\circ} 15' N.$ , alt. 9000-10000 ft., *G. Forrest*, no. 10117 (syntype of *S. sinobrahuica*), June 1913 (shrub 4-5 ft.; flowers creamy white); descent of the Yangtze valley from the eastern range of the Lichiang valley, Lat.  $27^{\circ} 30' N.$ , alt. 9000-10000 ft., *G. Forrest*, no. 10084 (syntype of *S. sinobrahuica* var. *aridicola*), June 1913 (shrub 4-6 ft.; flowers creamy white); mountains of Chungtien plateau, lat.  $27^{\circ} 30' N.$ , alt. 11000 ft., *G. Forrest*, no. 12634 (syntype of *S. sinobrahuica* var. *aridicola*; photo. in A. A.); open stony slopes and on ledges of dry cliffs on the western flank of the Lichiang range, Lat.  $27^{\circ} 40' N.$ , Long.  $100^{\circ} 18' E.$ , alt. 10-11000 ft., *G. Forrest*, no. 21171, May 1922 (shrub 3-5 ft.; flowers creamy-white); Yangtze valley, northwest of Likiang, Lat.  $27^{\circ} 20-30' N.$ ; alt. 2000-2100 m., *Handel-Mazzetti*, no. 8792, June 2, 1916; Yangtze watershed, Prefectural district of Likiang, eastern slopes of Likiang snow range, *J. F. Rock*, no. 3639, May-Oct. 1922; western slope of Likiang snow range, Yangtze watershed, *J. F. Rock*, no. 8557, April 1923 (shrub forming globose bushes); Lotueshan, mountains of Labako, west of Yangtze bend at Shiku, *J. F. Rock*, no. 8471, April 1923 (shrub 3-4 ft.; flowers white); dry rocky slopes and on cliffs on the Chien-chuan-Mekong divide, Lat.  $26^{\circ} 36' N.$ , Long.  $99^{\circ} 40' E.$ , alt. 9-10000 ft., *G. Forrest*, no. 21465, July 1922 (shrub of 2-3 ft.; flowers white); open dry rocky slopes and ledges of cliffs on the Mekong-Salween divide, Lat.  $28^{\circ} 12' N.$ ; alt. 7-9000 ft., *G. Forrest*, no. 16410, May 1918 (shrub 1-3 ft., flowers creamy white). S o u t h e a s t e r n T i b e t : Tsarong, open stony situations on the ledges of cliffs on the Salween-Kiu-chiang divide, Lat.  $28^{\circ} 40' N.$ , alt. 7000 ft., *G. Forrest*, no. 18881, July 1919; on ledges and in crevices of cliffs and dry bouldery slopes on the Salween-Kiu-chiang divide, Lat.  $28^{\circ} 40' N.$ , Long.  $98^{\circ} 15' E.$ , alt. 8000 ft., *G. Forrest*, no. 19147, Sept. 1919 (shrub 1-2 ft., widely branched).

I have been unable to find any characters to separate *Spiraea sinobrahuica* W. W. Sm. from *S. yunnanensis* Franch. The chief difference given by the author of the former name, the glabrous upper surface of the leaves of *S. yunnanensis*, does not hold, since the leaves of the type specimen of *S. yunnanensis* show the same pubescence of short accumbent hairs on their upper surface as the types of *S. sinobrahuica*, though Franchet describes them as glabrous, a statement which induced the author of *S. sinobrahuica* to consider Forrest's specimens distinct. It also does not seem possible to separate var. *aridicola* from the type.

The species which is closely related to *S. brahuica* Boiss. is very variable in the size, in the serration and to some extent in the shape of the leaves, in the size of inflorescence and in habit; the two extremes merge imperceptibly into each other and are apparently only individual differences caused by difference of exposure and soil. The only form which seems worthy of a distinct name on account of its striking habit is the following.

***Spiraea yunnanensis* f. *tortuosa*** (Rehd.), forma nova.

*Spiraea tortuosa* Rehder in Sargent, Pl. Wilson. i. 445 (1913).

CHINA. Szechuan: Mao-chou, arid regions of the Min valley, alt., 13-2000 m., *E. H. Wilson*, no. 2764 (holotype of *S. tortuosa*), May 25, 1908 (shrub 3-4 ft.; flowers white).

This differs strikingly from the type in its distinctly zigzag branchlets, the perfectly straight internodes forming sharp angles of about 130-150° with each other; the leaves are suborbicular to broadly oval, more or less 3-lobed and scarcely exceed 12 mm. in length; the inflorescence is 5-12-flowered. The only specimens enumerated under the type which show any approach to zigzag branchlets, are Potanin's specimen from the same region and John R. Muir's specimens from western Szechuan. The specimens described as *S. sinobrahuica* var. *aridicola* may be considered as being nearest to f. *tortuosa*.

***Spiraea siccania*** (W. W. Sm.), spec. nov.

*Spiraea yunnanensis* Fr. var. *siccania* W. W. Sm. in Not. Bot. Gard. Edinb. x. 69 (1917).

Frutex 1-1.5 m. altus ramis gracilibus teretibus, hornotinis adpresse villosulis, annotinis glabris purpureo-fuscis partim decorticantibus; gemmae ovoideae, pluriperulatae perulis ovatis glabris ciliolatis. Folia ramulorum floriferorum (turionum non vidi) obovata vel ovalia, rarius oblongo-ovalia, 0.8-2 cm. longa et 6-10 mm. lata, apice rotundata vel obtusa, mucronulata, basi late cuneata vel fere rotundata, supra medium inaequaliter dentata vel crenato-dentata dentibus mucronulatis, interdum indistincte trilobata, supra laete viridia et glabra, subtus glauca ad costam nervosque tantum laxe pilosa, basi 3- vel 5-nervia, ceterum utrinque nervis 1-2 instructa; petioli 1-2 mm. longi, villosuli. Flores albi, subumbellati, circiter 12-20 ramulos paucifolios pedunculo 5-10 mm. longo incluso 1-2 cm. longos terminantes; pedicelli 5-10 mm. longi ut pedunculus villosuli; calyx turbinatus, circ. 1 mm. longus, ut lobi triangulares acutiusculi subaequilongi laxe villosuli; petala orbiculari-obovata, 3-4 mm. longa; stamina circ. 20, dimidia petala aequantia; discus conspicuus, annularis, 10-lobatus; carpodia villosula, stylo apicali fere 1 mm. longo coronata. Fructus non vidi.

CHINA. Yunnan: Lang-kong-Hoching mountains, Lat. 26° 16'

N., alt. 8000 ft., open dry situations, *G. Forrest*, no. 9912 (syntype of *S. yunnanensis* var. *siccanea*), May 1913 (shrub of 3-5 ft.; flowers white); Lang-kong-Hoching divide, Lat. 26° 10' N., alt. 8000 ft., dry stony situations amongst scrub, *G. Forrest*, no. 9972 (syntype of *S. yunnanensis* var. *siccanea*) May 1913 (shrub of 3-5 ft.; flowers creamy white).

This seems to be distinct enough to be specifically separated from *S. yunnanensis* Franch. from which it is readily distinguished by the leaves being quite glabrous above and only loosely pilose on the veins beneath; no forms intermediate in pubescence were found among the numerous specimens seen of *S. yunnanensis*, except perhaps one specimen collected between Batang and Tachienlu by John R. Muir, in which the pubescence though rather slight, is present nevertheless on both sides; at the same time the specimen has very small, 4-8-flowered inflorescences, very small leaves and slightly tortuous branchlets.

***Malus Rockii*, sp. nov.**

Arbor 8-10 m. alta, ramis pendulis; ramuli hornotini villosi, annotini glabrescentes fusci vel fusco-rubri; gemmae ovoideae, perulis atrofusci ovatis medio villosis ceterum fere glabris. Folia chartacea, elliptica vel ovato-elliptica, ovata ad ovato-oblonga, 6-12 cm. longa et 3.5-7 cm. lata, acuminata, basi rotundata, rarius late cuneata, argute et adpresse inaequaliter serrulata, dentibus mucronato-acuminatis, supra costa sparse villosa excepta glabra et in costa et nervis glandulosa, impresso-reticulata, subtus pallida, in costa, nervis et venulis manifeste elevatis crispo-villosa, interdum sparse in facie villosula, venulis trabecularibus conspicuis; petioli 2-4 cm. longi, villosi. Flores non visi. Fructus 2-4 vel solitarii, pedicellis 2-4 cm. longis villosis suffulti, ovoidei vel subglobosi, basi in petiolum abrupte attenuata, apice juniores tandem plus minusve leviter attenuati 1-1.5 cm. longi, calyce tarde deciduo, juniores apice et basi villosuli lobis calycinis lanceolatis extus intusque villosis partim coronati, maturitate carminei, luciduli, 5-loculares.

CHINA. Y u n n a n : west of Talifu, Mekong watershed, en route to Young-chang and Tengyueh beyond Lampba, along watercourses, alt. 7000 ft., *J. F. Rock*, no. 6842 (type), Sept.-Oct. 1922 (tree with long drooping branches; fruits carmine, cherry-like); Litiping range, Mekong-Yangtze divide, east of Weihsi, *J. F. Rock*, no. 11552, Oct. 1923 (tree 25 ft.); Yangtze watershed, western slopes of Likiang Snow Range, *J. F. Rock*, no. 5346, May 30-June 6, 1922 (tree 35 ft.).

This new species is apparently nearest to *M. baccata* (L.) Borkh. but the fruits are larger, the calyx is tardily deciduous and the leaves are rather densely pubescent and reticulate beneath. From *M. pumila*



Mill. which it resembles somewhat in its leaves, it is farther removed by the deciduous calyx and the slender-stalked small fruit not impressed at the base and the apex; also the leaves are more strongly reticulate and rounded at base. One might compare *M. Rockii* with the hybrids between *M. baccata* and *M. pumila* or *M. prunifolia* (Willd.) Borkh., but the calyx seems to be always deciduous and the leaves are pubescent and reticulate beneath; moreover, hybrids between these two northern species cannot be expected to occur in Yunnan even as escapes from cultivation, and the three specimens cited above are apparently from spontaneous trees.

***Malus hupehensis*** (Pamp.), comb. nov.

*Pirus communis* Pavolini in Nuov. Giorn. Bot. Ital. xv. 415 (1908).—  
Non Linnaeus.

*Pirus hupehensis* Pampanini in Nuov. Giorn. Bot. Ital. n. ser. xvii. 291 (1910).—Rehder in Sargent, Pl. Wilson. II. 265, 300 (1915).

*Pyrus baccata* Hemsley in Jour. Linn. Soc. xxiii. 255 (1886), quoad plantam e Chekiang.—Diels in Bot. Jahrb. xxix. 387 (1900).—  
Non Linnaeus.

*Pyrus spectabilis* Hemsley in Jour. Linn. Soc. xxiii. 258 (1886), quoad plantam e Kiangsi et Hupeh.—Diels in Bot. Jahrb. xxix. 387 (1900).—Non Aiton.

*Malus baccata* var. *himalaica* Schneider, Ill. Handb. Laubholz. I. 721, fig. 397s (1906), quoad plantam chinens. et fig.—Non *Pyrus baccata* var. *himalaica* Maxim.

*Malus theifera* Rehder in Sargent, Pl. Wilson. II. 283 (1915); in Jour. Arnold Arb. v. 192 (1924); viii. 121 (1927); Man. Cult. Trees Shrubs, 395 (1927).—Chun, Chin. Econ. Trees, 173, fig. 65 (1922).—Hers in Jour. N. China Branch R. As. Soc. LIII. 116 (1922); Liste Ess. Lign. Honan, 29 (1922).—Chung in Mem. Sci. Soc. China, I. 82 (Cat. Trees Shrubs China) (1924).—Hu & Chun, Icon. Pl. Sin. I. 32, t. (1927).—Wilson in Arnold Arb. Bull. ser. 3, I. 20, fig. (1927).

*Pyrus theifera* (Rehd.) Bailey in Rhodora, xviii. 155 (1916); Stand. Cycl. Hort. v. 2872 (1916).—Kew Handlist Trees Shrubs, ed. 3, p. 133 (1925).

It is rather unfortunate that the name of this species which as *Malus* or *Pyrus theifera* is already well known in horticultural literature as a highly ornamental Crabapple, has to be changed, but when examining last year in the Biondi herbarium at the Botanical Museum in Florence the type of Pampanini's *Pirus hupehensis*, I saw at once that this species is identical with my *Malus theifera*. When describing the latter species I had not seen a specimen of Pampanini's species, which according to the author's remarks was most closely related to *P. pashia* Buch.-Ham. and also to *P. communis* L. Owing to the world war, I was unable to obtain a specimen of the species from Florence and I, therefore,

mentioned (l. c. 265, 300) *P. hupehensis* among the doubtful species of *Pyrus*, but stated that it could not belong to *Pyrus* in the restricted sense, since the author described it as having three connate styles villous below. Later Pampanini apparently revised his opinion regarding the affinity of this species, since on a note dated December 1921 and pinned to the sheet of each type specimen he referred it to *Malus baccata* var. *himalaica* Schneid., making a new binomial combination of that variety under *Pirus* which, however, was never published. This identification, of course, came much closer to the true relationship of his *P. hupehensis*.

*Malus hupehensis* is widely distributed in mountainous regions of China at elevations of from 1000-2000 m. and extends south into Assam. It is represented in this herbarium by specimens from the following Chinese provinces: Shantung, Kiangsu, Honan, Chekiang, Kiangsi, Fukien, Hunan, Hupeh, Szechuan, Kweichou and Yunnan; also from Assam. The syntypes of *P. hupehensis* Pamp. were collected in northern Hupeh, Sian-men-kou (Silvestri, no. 939) and Ma-pau-scian (Silvestri, nos. 940, 9402); of nos. 939 and 940 there are photographs in this herbarium. The holotype of *M. theifera* also came from Hupeh, near Ichang (Wilson, no. 451), and the paratypes from other localities in Hupeh, from Shensi, Chekiang, Szechuan and Assam.

A form with rosy-pink flowers is the following:

***Malus hupehensis* f. *rosea* (Rehd.), comb. nov.**

*Malus theifera* f. *rosea* Rehder in Sargent, Pl. Wilson. II. 284 (1915);  
Man. Cult. Trees Shrubs, 395 (1927).

*Pyrus theifera* var. *rosea* (Rehd.) Bailey in Rhodora, XVIII. 155  
(1916); Stand. Cycl. Hort. v. 2872 (1916).

This form has been found in Hupeh; the type comes from Fang Hsien, (Wilson, no. 2980) and a paratype from Patung Hsien (Wilson, Veitch Exped. seed no. 766, Oct. 1900; specimen from Kew Bot. Gard., Wm. Bean, May 1914).

***Prunus Slavinii* Palmer, hybr. nov.**

*Prunus angustifolia* var. *varians* Wight & Hedrick  $\times$  *P. gracilis*  
Engelm. & Gray.

Frutex, 4-12 dm. altus, raro arborescens et ad 2-2.5 m. altus, dense ramosus, ramulis spinescentibus, novellis brunneo-rubrescentibus glabris vel pubescentibus, vetustioribus cinereo-brunneis. Folia lanceolata vel ovato-lanceolata, tenuia sed firma, supra fere glabra, infra glabra vel pubescentia, venulis reticulatis; petioli graciles, 1-1.5 cm. longi glabri vel pubescentes, eglandulosi vel raro glandulosi. Flores 2-6-umbellati, pedicellis 9-12 mm. longis glabris vel pubescentibus. Fructus ovoideus vel subglobosus, 1.5-2.2 cm. longus, 1-2 cm. latus, ruber, pallide punctatus, vel rubro-luteus, succosus, esculentus.

Slender or arborescent shrubs .5 to 1 m. or rarely 2 to 2.5 m. tall, with numerous spreading or ascending somewhat spinescent branches, those of the last year's growth reddish-brown. Bark on old stems and branches dark gray or gray-brown, with pale lenticels. Leaves lanceolate or ovate-lanceolate 3.5-7 cm. long, 1-2.5 cm. wide, rounded or slightly subcordate at base, rounded, acute or short-acuminate at apex, finely serrate with shallow gland-tipped teeth, bluish-green and glabrous or sparsely pubescent above, paler and usually more densely pubescent beneath, sometimes only along the prominently reticulate veins, thin but firm in texture, on slender eglandular or rarely glandular petioles. Flowers appearing in March or early April before the leaves in 2-6-flowered umbels, on slender pubescent or nearly glabrous pedicels; ovary usually somewhat pubescent, rarely glabrous; calyx-teeth lanceolate, usually with entire margins, glabrous or slightly pubescent without, pubescent within; petals ovate, clawed, 3-4 mm. long; stamens numerous; anthers yellow or rarely red. Fruit ovoid or nearly globose, 1.5-2 cm. long, 1-2 cm. broad, bright to dark crimson with pale dots, or orange-yellow with red cheek; flesh yellow, becoming soft and succulent. Stone compressed-ovoid, 10-12 mm. long, 9-10 mm. wide, rounded at base, pointed at apex, slightly keeled and grooved on ventral side.

Growing in thickets, in sandy ground, within the range of the parent species and apparently always in close association with them. Range, from the Arkansas River valley in southeastern Kansas, through central Oklahoma, and probably to be expected also in eastern and central Texas.

NORTH AMERICA. K a n s a s : Arkansas City, Cowley Co., *B. H. Slavin*, no. 164, April 10, July 4, 1914; *E. J. Palmer*, no. 21254, May 11, 1922. O k l a h o m a : Sapulpa, *B. H. Slavin*, no. 132, April 1, June 29, 1914; Muskogee, *B. H. Slavin*, no. 128, March 31, June 26, 1914; Oklahoma City, *B. H. Slavin*, no. 143, July 2, 1914, no. 144, April 4, July 2, 1914, no. 145, April 4, July 2, 1914, no. 146, April 4, July 2, 1914, no. 152, April 5, July 1, 1914 (**type**), no. 252, March 27, June 29, 1916; Norman, *B. H. Slavin*, no. 251, March 27, June 29, 1916; Chickasaw, *B. H. Slavin*, no. 257, March 29, 1916, no. 259, March 29, June 30, 1916, no. 260, June 30, 1916, no. 262, March 29, June 30, 1916; Kingfisher, *B. H. Slavin*, no. 329, April 12, July 5, 1916, no. 330, April 12, July 5, 1916, no. 331, April 12, July 5, 1916, no. 332, April 12, July 5, 1916, no. 334, July 5, 1916; Anadarko, *E. J. Palmer*, no. 12601, July 20, 1917. Also cultivated in the Arnold Arboretum and in Durand-Eastman Park, Rochester, N. Y.

The Chickasaw Plum (*Prunus angustifolia* Marsh.) is widely dis-

tributed in the southern states, from Maryland and Delaware to Florida, Oklahoma, and Texas. In the western part of its range, the var. *varians* Wight & Hedrick, is the commoner form, and it is found abundantly in sandy soil in central Kansas, Oklahoma, and northwestern, central and eastern Texas, where it often forms large thickets of spiny shrubs, 4 to 6 or eight feet in height. The yellow or red fruit matures early and is often of excellent quality. The leaves are prevailingly lanceolate, thin, nearly or quite glabrous, and with only the mid-veins prominent. They are usually conduplicate, making them appear narrower than they really are.

The Sand Plum (*Prunus gracilis* Engelm. & Gray) is found in the western part of the same range, from the valley of the Arkansas River, in southeastern Kansas, and along the western border of southern Arkansas, through most of Oklahoma and eastern Texas as far west as the Brazos River. It is a low slender shrub, usually from 1 to 4 feet in height. The leaves are oval or ovate, gray-green, of firm texture, slightly pubescent above and densely so beneath, and with prominent reticulate veins. The fruit is slightly smaller than that of the Chickasaw Plum, and is edible. It is sometimes borne in such profusion as to weigh the slender branches to the ground. The two species bloom simultaneously and apparently hybridize freely, judging by the number of specimens found.

*Prunus Slavini* is quite intermediate in habit and character between the two parent species, and different individuals differ considerably in size and in the pubescence and prominence of the reticulation of the leaves. The specific name is for Mr. B. H. Slavin, superintendent of the splendid park system of Rochester, N. Y., who first collected this interesting Plum and brought it into cultivation there and at the Arnold Arboretum. The type specimen and all of the other numbers cited here are in the herbarium of the Arnold Arboretum.

ERNEST J. PALMER

***Calophaca sinica*, sp. nov.**

Frutex erectus ramis robustis, hornotinis dense albido-pubescentibus, annotinis cortice purpureo-fusco laminis soluto ochraceo-albidis. Stipulae scariosae diu persistentes. Folia pinnata, cum petiolo 3-5 cm. longa, pleraque 7-foliolata; foliola chartacea, ovalia vel obovato-ovalia, 12-18 mm. longa et 7-12 mm. lata, apice rotundata vel truncata, basi rotundata et saepe leviter subcordata, supra cinereo-viridia, maturitate fere glabra, subtus pallidiora, minute et laxe villosula, reticulo venularum satis manifesto, nervis utrinsecus 5-6, supra leviter subtus magis elevatis; petioluli villosi, 1 mm. breviores; petioli 5-12 mm. longi, ut rhachis albido-villosuli. Pedunculi circiter 4 cm. longi longe patentim

villosi et apicem versus stipitato-glandulosi, pauciflori; flores non visi; legumen oblongum, circ. 3 cm. longum, villosum, glandulis longe stipitatis crebris munitum, calyce villosa et stipitato-glanduloso lobis lineari-lanceolatis tubum subaequantibus suffultum.

CHINA. S h a n s i : Chiao-cheng hsien, alt. 3000 ft., *W. Y. Hsia*, no. 1032, May 13, 1929.

The discovery of this new species in Shansi is of interest particularly for the reason that it extends the range of the genus farther to the East into the flora of China.

The genus in its restricted sense (excl. of sect. *Chesneya*) ranges from southern Russia and the Caspian region through Turkestan (*C. wolgarica* Fisch.), Bokhara (*C. grandiflora* Reg.) Tian-shan (*C. wolgarica* var. *tianschanica* [B. Fedtch.] Popov) to Dsungaria (*C. Hovenii* Schrenk) and now extends into northeastern China.

From *C. wolgarica* the new species differs chiefly in the fewer and larger leaflets, the absence of glands from the rachis and the lower half of the peduncle; from *C. grandiflora* in the fewer leaflets, few-flowered raceme and the stalked glands of the legume and from *C. Hovenii* chiefly in the larger leaflets the spreading pubescence and the presence of stipitate glands on the inflorescence and the legume.

**Acer** sect. **Macrantha** Pax, emend. Rehd.

The section MACRANTHA is one of the most difficult of the sections of *Acer* on account of the rather uniform character of the inflorescence, flowers and fruit and of the variability of the foliage with apparently intermediate forms between the species. The section is here limited as proposed by me in 1911 (in Sargent, Pl. Wilson. i. 92) where I included into this section proposed by Pax in 1886 (in Bot. Jahrb. vii. 244) several species referred by Pax to his sect. INDIVISA, namely *A. sikkimense* Miq., *A. Hookeri* Miq., *A. Davidi* Franch., *A. laxiflorum* Pax and *A. crataegifolium* Sieb. & Zucc., but I excluded *A. parviflorum* Franch. & Sav. and *A. erosum* Pax which is a synonym of *A. caudatum* Wall. var. *multiserratum* (Maxim.) Rehd. and belongs like *A. parviflorum* to the sect. SPICATA. Another species erroneously referred to the MACRANTHA by Handel-Mazzetti and by Fang, is *A. Wardii* W. W. Sm. (*A. mirabile* Hand.-Mazz.) which belongs to the sect. SPICATA into the affinity of *A. sinense* Pax; the inflorescence, though typically paniculate, is sometimes reduced to a simple raceme as in the type of *A. mirabile*, but in the bracted and opposite rather long and ascending pedicels and in the flowers it differs from the MACRANTHA section. Besides the seven Chinese species distinguished here, there are eight species in Eastern Asia outside of China (*A. crataegifolium* Maxim.,

*A. capillipes* Maxim., *A. tegmentosum* Maxim., *A. rufinerve* S. & Z., *A. micranthum* S. & Z., *A. Tschonoskii* Maxim., *A. morrisonense* Hay. and *A. rubescens* Hay.), three in India (*A. sikkimense* Miq., *A. Hookeri* Miq. and *A. pectinatum* Wall.) and one in Eastern North America (*A. pennsylvanicum* L.).

Of the Chinese species *A. Davidi* is the most widely distributed and is found in all provinces of China except in Hopei and Shantung. The other species are of more restricted distribution and each seems to occupy a fairly well defined area. *Acer laxiflorum* Pax is restricted to Szechuan and southeastern Tibet. *Acer taronense* ranges from northern Szechuan through western Yunnan to eastern Tibet and northern Burma. *Acer Forrestii* is found in southwestern Szechuan and western Yunnan. *Acer Maximowiczii* is a northwestern species and extends from southern Shensi and Kansu into northern Szechuan and into Hupeh; a rather distinct form is found in Kweichou. *Acer Grosseri* with var. *Hersii* is found in northern China from Kansu to Hopei and extends south to Hupeh and through Honan to Anhwei. *Acer Metcalfi* is known so far only from Kwangtung and from Hunan, if *A. Davidi* f. *trilobata* is identical with it.

As neither inflorescence, nor flowers or fruits in this section seems to show distinctive and reliable characters, the following key is based exclusively on the leaves which allows identification of both flowering and fruiting specimens.

#### KEY TO THE CHINESE SPECIES

- A. Leaves not lobed, doubly crenate-serrate with obtusish or acutish teeth .....1. *A. Davidi*
- AA. Leaves more or less lobed.
  - B. Margin of leaves with 5 or more acute or acuminate teeth to 1 cm.
    - C. Leaves with rusty pubescence on the veins beneath;
      - D. Lateral lobes short, acute; flowers red (?always).  
2. *A. laxiflorum*
    - DD. Lateral lobes elongated, acuminate; teeth acuminate to aristate. ....3. *A. taronense*
  - CC. Leaves glabrous beneath except axillary beards in some species.
    - D. Leaves doubly and sharply serrate with acuminate teeth; middle lobe elongated, the lateral below the middle of the leaf, long acuminate, sometimes short on part of the leaves.
    - E. Leaves 6-12 cm. long without or occasionally with small basal lobes, finely and closely doubly serrulate; lateral lobes sometimes short and acute, pointing forward.  
4. *A. Forrestii*

EE. Leaves 4-8 cm. long, with distinct basal lobes rarely without, incisely doubly serrate or lobulate; lateral lobes always long-acuminate, spreading...5. *A. Maximowiczii*

DD. Leaves unequally or doubly serrate with obtusish mucronulate teeth; middle lobe triangular-ovate; lateral lobes short, acute or short acuminate, rarely long-acuminate. ....6. *A. Grosseri*

BB. Margins of leaves coarsely and irregularly dentate with 2-3, rarely 4, obtuse teeth to 1 cm., lobes acuminate with entire acumen. ....7. *A. Metcalfi*

1. **Acer Davidi** Franchet in Nouv. Arch. Mus. Paris, sér. 2 VIII. 212 (Pl. David. II. 30) (1884).—Pax in Engler, Pflanzenr. IV.-163, p. 36 (1902).—Rehder in Sargent, Trees & Shrubs, I. 167, t. 83 (1905); in Jour. Arnold Arb. VII. 221 (1926); VIII. 163 (1927); IX. 90 (1928).—Fang in Contr. Biol. Lab. Sci. Soc. China, VII. 174 (1932).—Fig. 1.

*Acer Davidi* var. *glabrescens* Pax in Hooker, Icon. XIX. sub t. 1897 (1889); in Bot. Jahrb. XXIX. 449 (1900); in Engler, Pflanzenr. IV.-163, p. 36 (1902).—Rehder in Sargent, Trees and Shrubs, I. 167 (1905).

*Acer Davidi* l. *tomentellum* Schwerin in Gartenfl. XLII. 230 (1893).—Pax in Engler, Pflanzenr. IV.-163, p. 36 (1902) "var.  $\alpha$ ."

*Acer Davidi* var. *horizontale* Rehder in Sargent, Trees and Shrubs, I. 168 (1905), pro parte, quoad specim. Wilson, no. 1882.—Non Pax.

*Acer Cavaleriei* Léveillé in Fedde, Rep. Spec. Nov. x. 432 (1911).

*Acer laxiflorum* var. *integrifolium* Fang in Contrib. Biol. Lab. Sci. Soc. China, VII. 174 (1932).

DISTRIBUTION: Kansu, Kiangsi, Chekiang, Anhwei, Kiangsi, Hunan, Kwangtung, Kwangsi, Kweichou, Szechuan, Yunnan and southeastern Tibet.

I have seen numerous specimens from all the provinces of China named above. This shows that the species is widely distributed throughout China except the northern and northeastern provinces Shensi, Shansi, Hopei, Honan and Shantung.

I do not think that var. *glabrescens* Pax is distinct enough to be separated as a variety or form. Its holotype, Henry, no. 7085, shows even on the mature leaves remnants of the brown tomentum. Var. *tomentellum* Schwerin represents the typical form.

*Acer Cavaleriei* Lévl. of which I have a duplicate of the holotype, Cavalerie, no. 3345, before me differs slightly in the rather narrow oblong leaves 2.8-3.2 cm. wide, rounded, not subcordate at base, quite glabrous beneath, with simple and rather slight crenate serration and an entire acumen; the wings of the fruit spreading horizontally.

*Acer laxiflorum* var. *integrifolium* Fang from Mt. Omei, Szechuan, of which I have a duplicate of the holotype, Fang, no. 2692, does not seem to differ from *A. Davidi* except that the leaves are comparatively small.

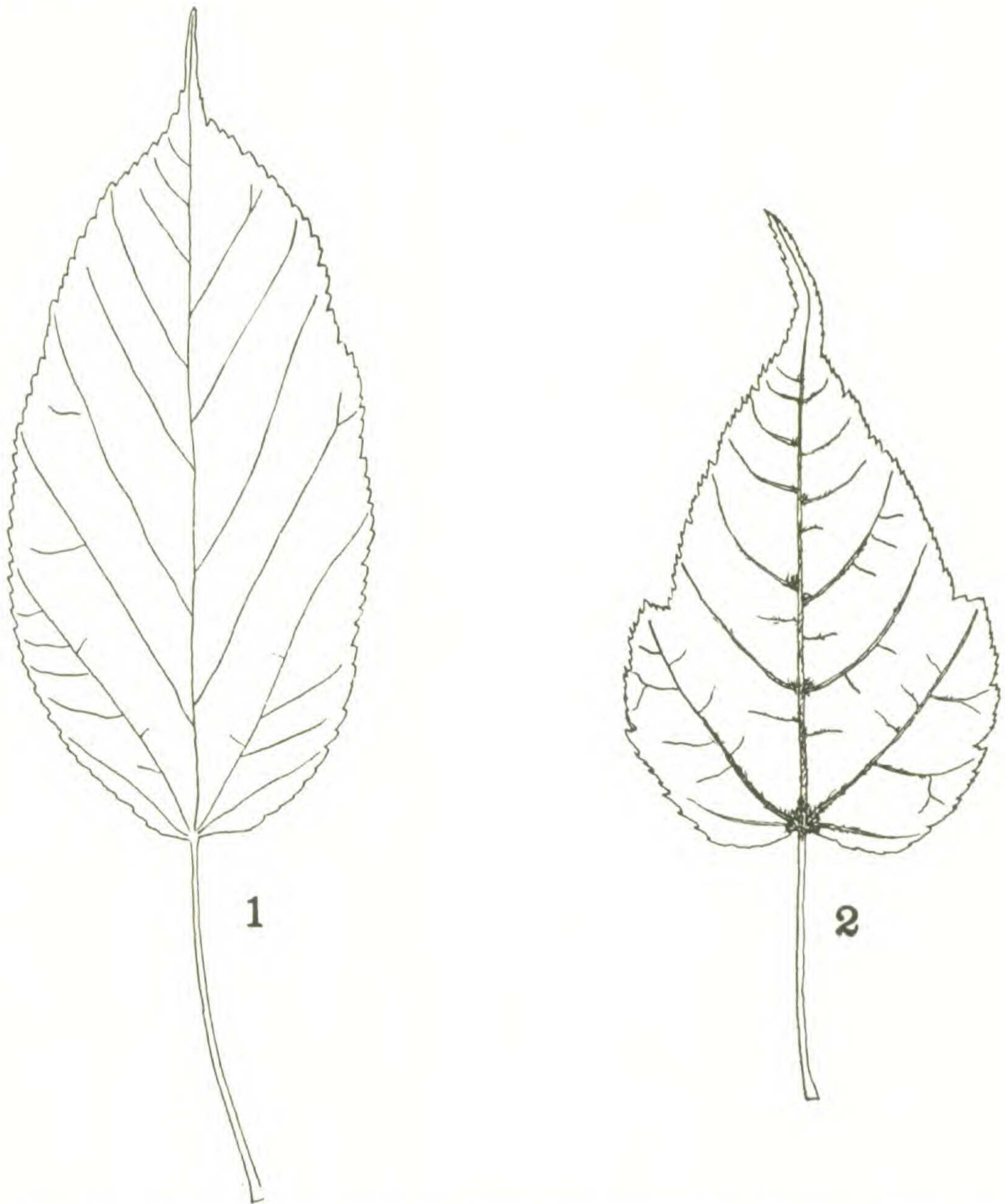


FIG. 1. *ACER DAVIDI* Franch.: leaf (2/3 nat. size) from Wilson, no. 1005a Mupin (type locality).—FIG. 2. *ACER LAXIFLORUM* Pax: leaf (2/3 nat. size) from Faber, no. 433, Mt. Omei (syntype).

2. ***Acer laxiflorum*** Pax in Engler, Pflanzenr. iv.-163, p. 36 (*Acer.*) (1902).—Rehder in Sargent, Trees & Shrubs, i. 180 (1905); in Sargent, Pl. Wilson. i. 93 (1911), excl. synonym.—Fang in Contrib. Biol. Lab. Sci. Soc. China, vii. 178 (1932).—Fig. 2.



SZECHUAN: Mt. Omei, *E. Faber*, no. 453 (syntype), *E. H. Wilson*, Veitch Exp. 3349a, *W. P. Fang*, no. 2874; Nanchuan Hsien, *W. P. Fang*, no. 1191; Pan-han-shan, *E. H. Wilson*, nos. 1904, 4142; Kuan hsien, *W. P. Fang*, no. 2369; Wenchuan-Hsien, *E. H. Wilson*, nos. 1309, 4099, 4108; Wa-shan, *E. H. Wilson*, no. 1154; Mupin, *E. H. Wilson*, nos. 1007, 1007a, 1069, 1234; Tachienlu, *E. H. Wilson*, no. 1309, *W. P. Fang*, no. 3664. SOUTHEASTERN TIBET: Tsarong, *G. Forrest*, no. 21671; Mt. Kenyichunpo and region of Champotong, Salween-Irrawadi watershed, *J. F. Rock*, no. 10242.

*Acer laxiflorum* is closely related to *A. Davidi* Fr. from which it may be distinguished by the lobed leaves with sharper acute serration, longer and slenderer acumen and with pubescent veins beneath. It also is very close to *A. Forrestii* W. W. Sm. from which it differs in its broader and larger leaves pubescent on the veins beneath though the pubescence is sometimes rather slight. The flowers and young fruits of *A. laxiflorum* are more or less purple or red, but occasionally the flowers may be greenish as in Wilson's no. 1309, though the fruits of the same number are reddish. The flowers of the two other species are always greenish.

***Acer laxiflorum* var. *longiphyllum*** Fang in Contr. Biol. Lab. Sci. Soc. China, VII. 179 (1932).

This variety based on Fang's no. 4513 from Ma-pien-hsien, which I have not seen, does not appear according to the description to differ much, if at all, from the type. Neither have I seen *A. laxiflorum* var. *ningpoense* Pax in Engler, Pflanzenr. iv.-163, p. 36 (1902).

3. ***Acer taronense*** Handel-Mazzetti in Anz. Akad. Wiss. Wien, 1924, p. 84 (Pl. Nov. Sin. Forts. 25, p. 3).—Fig. 3.

*Acer laxiflorum* Pax var. *longilobum* Rehder in Sargent, Pl. Wilson. I. 94 (1911), excl. specim. Wilson, 4108.

SZECHUAN: Chin-ting-shan, *E. H. Wilson*, no. 1927 (type of *A. laxiflorum* var. *longilobum*); Tu-ti-liang Mts., Lungan-fu, *E. H. Wilson*, no. 4509. YUNNAN: "prope fines tibeto-birmanicas inter fluvios Ludjiang (Salween) et Djiou-djiang (Irrawaddi), *Handel-Mazzetti*, no. 9385 (type of *A. taronense*); Mt. Gitsa west of Mekong and north of Wei-hsi, *J. F. Rock*, no. 18425; without precise locality, *G. Forrest*, nos. 8990 and 9059. EASTERN TIBET: without precise locality, *G. Forrest*, nos. 26317 and 26581. UPPER BURMA: *G. Forrest*, 26501 and 27269.

*Acer taronense* is closely related to *A. laxiflorum* Pax, but the leaves differ in the caudate-acuminate lateral lobes, broader and comparatively shorter middle lobe, finer and closer serration with aristate teeth and more densely pubescent veins beneath, though glabrescent at maturity. In the less fine and close serration the Szechuan specimens approach *A. laxiflorum*, but the lateral lobes are caudate-acuminate. On none

of the specimens is the pubescence quite as dense on the veins as in the type specimen. The racemes of the Burma and Tibetan specimens are quite long (about 7-8 cm.) and many-flowered, while in Wilson's no. 1927 they are only 4-5 cm. long and about 10-flowered. It is also closely related to *A. pectinatum* Wall., which is distinguished by the usually 5-lobed leaves more deeply cordate at base and glabrous beneath except the bearded axils; in its very close aristate serration it approaches the specimens of *A. taronense* from Burma.

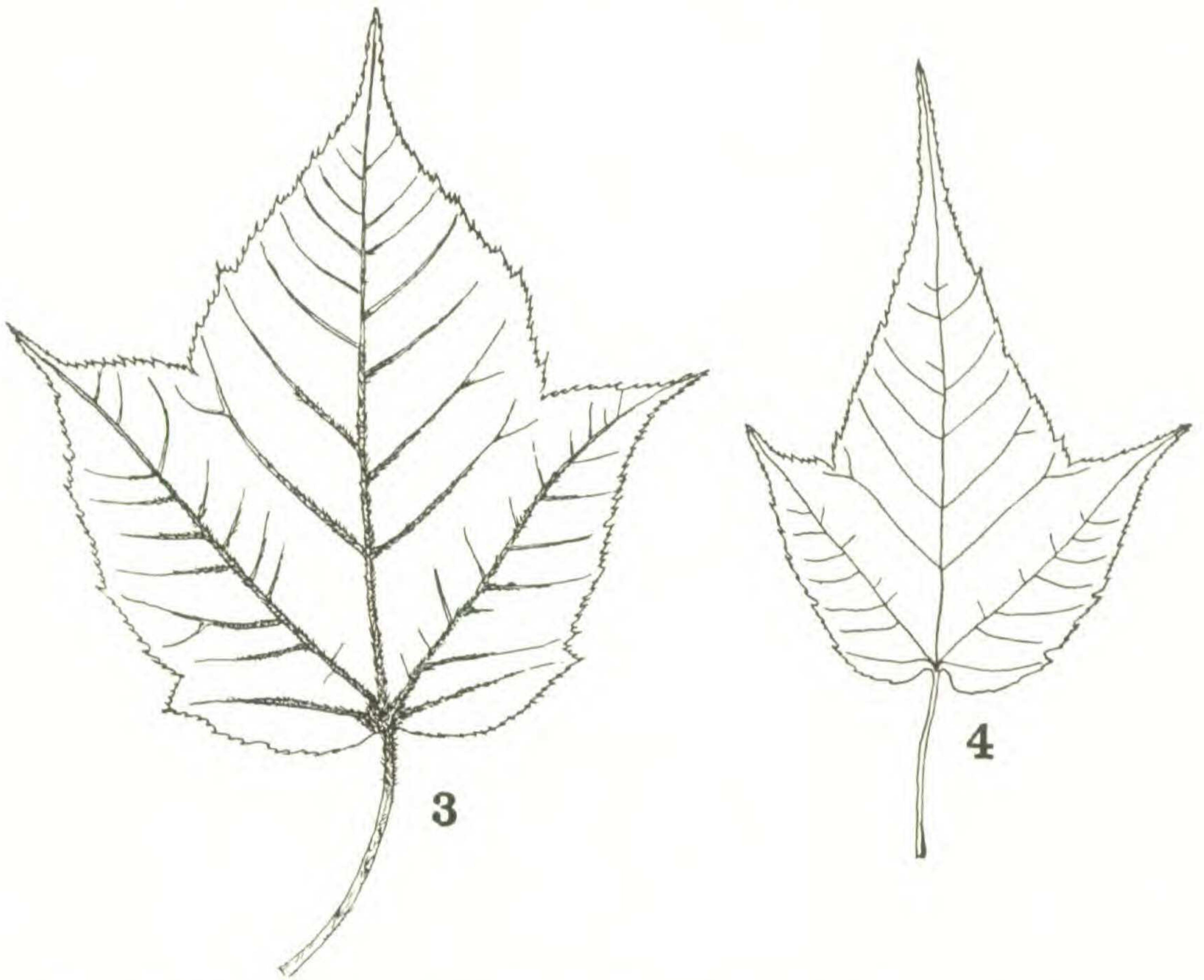


FIG. 3. *ACER TARONENSE* Hand.-Mazz.: leaf (2/3 nat. size) from Handel-Mazzetti, no. 9385 (holotype).—FIG. 4. *ACER FORRESTII* Diels: leaf (2/3 nat. size) from G. Forrest, no. 2106 (holotype).

4. ***Acer Forrestii*** Diels in Not. Bot. Gard. Edinb. v. 165 (1912).—Fig. 4.

*Acer laxiflorum* Rehder in Sargent, Pl. Wilson. i. 93 (1911), in part.—Fang in Contr. Biol. Lab. Sci. Soc. China, vii. 178 (1932), in part.—Non Pax.

SOUTHERN SZECHUAN: east of Ning-yuan-fu, *C. Schneider*, no. 959; between Ouentin and Kalapa, *C. Schneider*, no. 1462; between Hunke and Woloho, *C. Schneider*, no. 1499; Kingdom of Muli, *J. F. Rock*, nos.

17993, 18046 and 18230, *G. Forrest*, no. 21337. YUNNAN: Likiang range, *G. Forrest*, no. 2106 (holotype), *C. Schneider*, nos. 1909, 3281, 3338, 3338a, *J. F. Rock*, nos. 3490, 3761, 4231, 5105, 5404; north of Wei-hsi, *J. F. Rock*, no. 17062; near Pe-yen-tsin, *S. Ten*, no. 548; between Chien-chuan plain and Mekong drainage basin, *J. F. Rock*, no. 8630; Chien-chuan-Mekong divide, *G. Forrest*, no. 22380; Mekong-Salween divide, *G. Forrest*, no. 20009, *J. F. Rock*, no. 8893; without precise locality, *G. Forrest*, nos. 10063, 11226, 11279.

*Acer Forrestii* is closely related to *A. laxiflorum* Pax, but differs in the glabrous and glaucescent under-side of its leaves; the forms with longer acuminate lobes approach *A. Maximowiczii* Pax, but can be distinguished by the finer and closer serration, the absence of the basal pair of lobes and the glaucescent under-side. The flowers are mostly greenish, but Rock's no. 8893 has red flowers; also the fruits of Rock's no. 5404, of Schneider's no. 1909 and Forrest's no. 20009 are distinctly red or reddish.

***Acer Forrestii* f. *caudatilobum***, forma nova.—Fig. 5.

A typo differt lobis longe caudato-acuminatis, lobis lateralibus lobo medio plerumque plus quam dimidio longioribus.

YUNNAN: Yangtze watershed, western slopes of Likiang Snow Range, *J. F. Rock*, no. 4149, May 30—June 6, 1922 (tree 10 m.; petioles and stems red).

With its caudate-acuminate lobes, the lateral ones mostly more than half as long as the middle lobe, this form looks so strikingly different from the type that it seems desirable to distinguish it as a form.

5. ***Acer Maximowiczii*** Pax in Hooker, Icon. XIX. sub t. 1897 (1889); in Engler, Pflanzenr. iv.-163, p. 70 (1902).—Rehder in Jour. Arnold Arb. VII. 223 (1926); IX. 90 (1928).—Fang in Contr. Biol. Lab. Sci. Soc. China, VII. 180 (1932).—Fig. 6.

*Acer urophyllum* Maximowicz in Act. Hort. Petrop. XI. 105 (1890).—Rehder in Sargent, Trees and Shrubs, I. 169, t. 84 (1905).

HUPEH: without precise locality, *A. Henry*, nos. 6857 (syntype) and 6783, *E. H. Wilson*, Veitch Exp. nos. 1891 and 2343; Mt. Ngo-san, *Hugh Scallan*; Chang-yang, *E. H. Wilson*, Veitch Exp. no. 724; South Wushan, *E. H. Wilson*, no. 229; Fang-hsien, *E. H. Wilson*, nos. 355 (in part), 1914 (in part) and 4427; Hsing-shan-hsien, *E. H. Wilson*, nos. 355 (in part) and 1914 (in part); Ichang, *E. H. Wilson*, nos. 355 (in part) and 1914 (in part); Hsao-lung-T'an, *W. Y. Chun*, nos. 4220 and 4618; Shin-tien-tze, *W. Y. Chun*, 4030. SHENSI: Tai-pei-shan, *W. Purdom*, nos. 947 and 948. KANSU: Lower Tebbu country, Want-sang forests, *J. F. Rock*, nos. 14682, 14703, 14706, 14730, 14814, 14855,

15031, 15041 and 15047; Tsaushi-ku, *J. F. Rock*, no. 14735; Dayaya, *J. F. Rock*, no. 14784; Pezhu valley, *J. F. Rock*, no. 14946; Tsaoshiku, *J. F. Rock*, no. 14998; Lien-hoa-shan, Shanshen-miao, *J. F. Rock*, no. 13488; vicinity of Choni, *R. C. Ching*, no. 1009. SZECHUAN: Singpan-hsien, *E. H. Wilson*, nos. 4100 and 4513, *W. P. Fang*, no. 4171; Nanchuan-hsien, *W. P. Fang*, no. 931. KWEICHOU: Fan-ching-shan, *Steward, Chiao & Cheo*, no. 500.

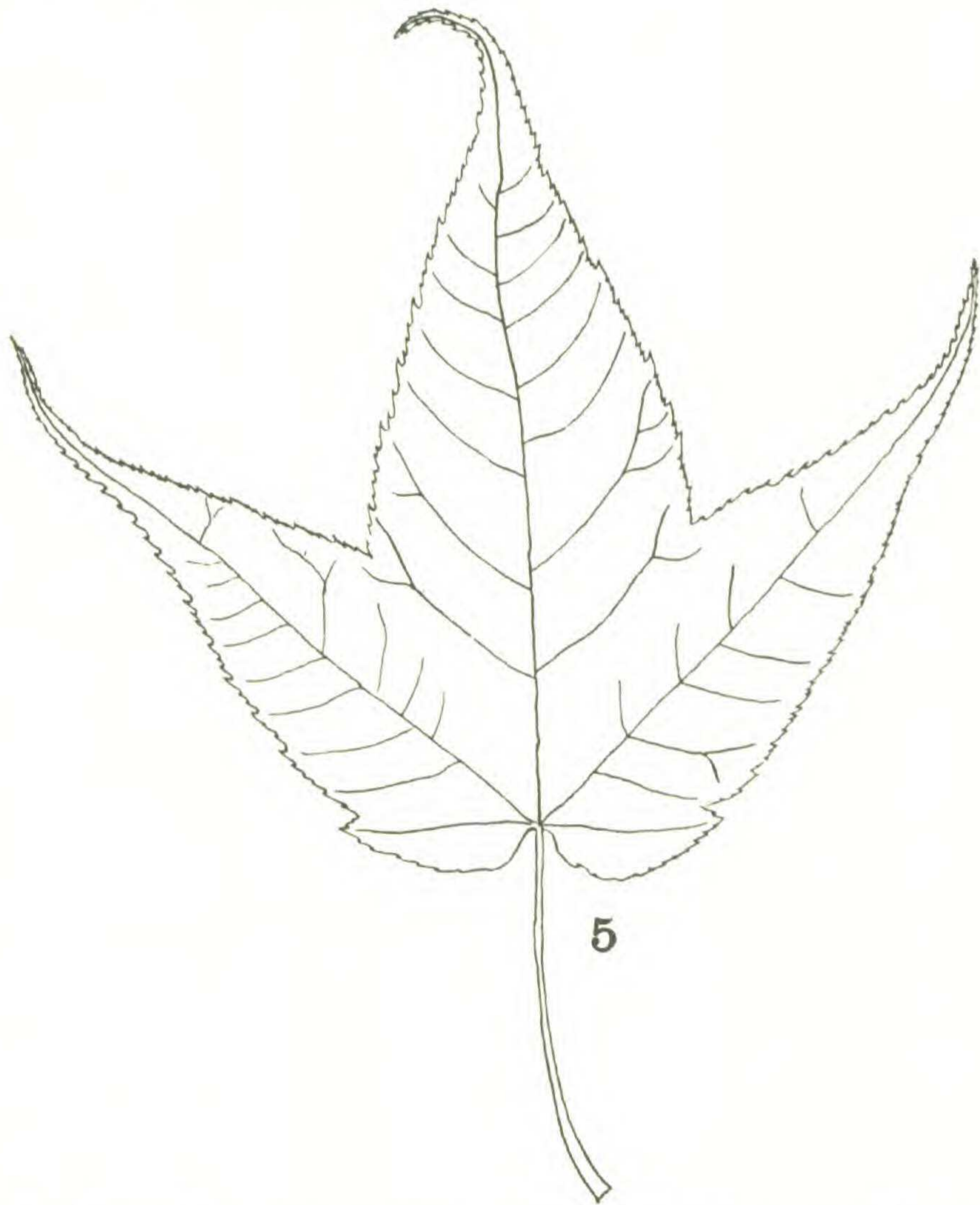


FIG. 5. *ACER FORRESTII* f. *CAUDATILOBUM* Rehd.: leaf (2/3 nat. size) from *J. F. Rock*, no. 4149 (holotype).

*Acer Maximowiczii* is very similar to *A. Forrestii* Diels, but may be distinguished by the smaller leaves with coarser, distinctly double and even lobulate serration, by the presence of two small basal lobes, though often much reduced or sometimes lacking, and by the more elongated and spreading lateral lobes. In the Kansu specimens collected by *Rock* the basal lobe is mostly lacking, but the serration and the general

shape and size of the leaf is that of *A. Maximowiczii*. The specimen from Kweichou (Steward, no. 500) has much larger leaves up to 10.5 cm. long and 8.5 cm. wide with the teeth more acuminate, but they are distinctly 5-lobed and lobulate and the lobes abruptly contracted in the long acumen. Possibly it should be considered a distinct variety.

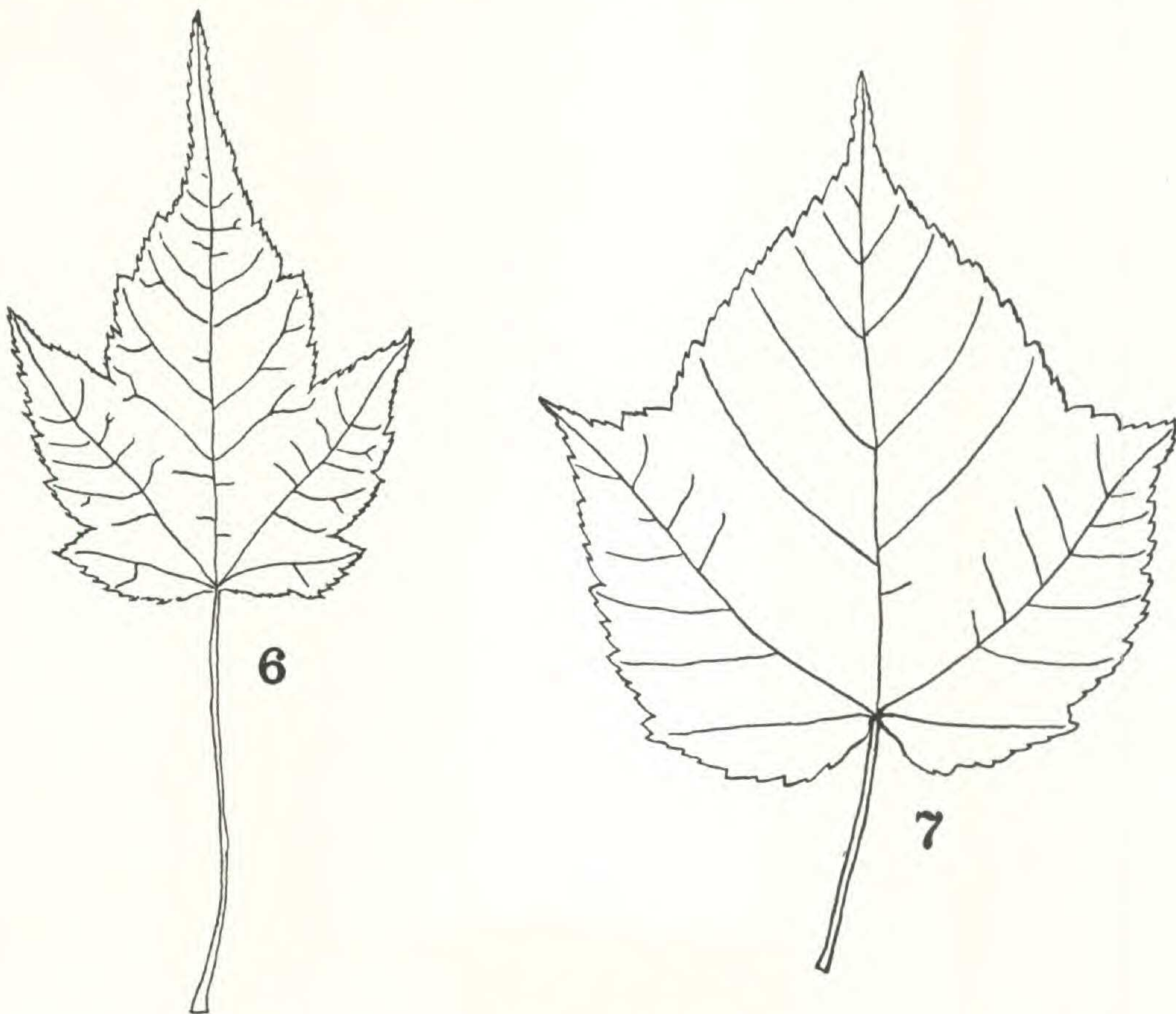


FIG. 6. *ACER MAXIMOWICZII* Pax: leaf (2/3 nat. size) from Henry, no. 6783. FIG. 7. *ACER GROSSERI* Pax: leaf (2/3 nat. size) from Harry Smith, no. 7932, Shansi.

***Acer Grosseri*** Pax in Engler, *Pflanzenr.* iv.-163, p. 80 (1902).—Rehder in Sargent, *Trees & Shrubs*, i. 181 (1905); in *Jour. Arnold Arb.* vii. 222 (1926); viii. 163 (1927); ix. 90 (1928).—Fang in *Contr. Biol. Lab. Sci. Soc. China*, vii. 181 (1932).—Fig. 7.

*Acer Davidii* var. *Y horizontalis* Pax in Engler, *Pflanzenr.* iv.-163, p. 79 (1902); in *Bot. Jahrb.* xxxvi. beibl. lxxxii. 72 (1905).—Rehder in Sargent, *Trees and Shrubs*, i. 168 (1905), excl. Wilson. no. 1882.—Hers in *Jour. N. China Branch R. As. Soc.* liii. 106 (1922); *Liste Ess. Lign. Honan* Sept. 1 (1922).

*Acer Davidii* var. *glabrescens* Pax in *Bot. Jahrb.* xxxvi. beibl. lxxxii. 73 (1905).—Non Pax (1889).

*Acer Pavolinii* Pampanini in *Nouv. Giorn. Bot. Ital.* xvii. 422 (1910).

*Acer Hersii* Rehder in *Jour. Arnold Arb.* iii. 217 (1922), pro parte.

HOPEI: without precise locality, *Père Chanet*, no. 90. SOUTHERN SHANSI: Chich-hsin, *Harry Smith*, no. 7932, 5895; Shih-li-p'o-shan, *Harry Smith*, no. 6780; Mien-shan, Lin-shih-hsien, *T. Tang*, no. 970; Chin-yuan, Lin-kon-shan, *K. Ling*, no. 9346. SHENSI: Kan-y-san, *G. Giral-di*, no. 2121 (holotype; photo. in A. A.); Lin-tou-san, *G. Giral-di*, July 14, 1897; Mt. Marg-hua-san, west of Singan-fu, *G. Giral-di*, Oct.-Nov. 1894; Tai-pei-shan, *W. Purdom*, no. 949; Thui-kio-tsuen and Mt. Ngo-san, *Hugh Scallan*, in 1899; Hua-shan, *J. Hers*, no. 3080; 60 km. south of Sian-fu, *J. Hers*, nos. 2950, 2999; Lung-chow, *J. Hers*, no. 2359. KANSU: Lower Tebbu country, Mayaku, *J. F. Rock*, no. 15053. HUPEH: Ku-tcen, *C. Silvestri*, no. 1377 (syntype of *A. Pavolinii*; photo. in A. A.); Ou-tan-scian, *C. Silvestri*, nos. 1370, 1371. NORTH HONAN: Sung-shien, *J. Hers*, no. 533; Lu-shi, *J. Hers*, no. 1169. ANHWEI: Chu-hwa-shan, *R. C. Ching*, no. 2613.

*Acer Grosseri* is very close to *A. Davidi* from which it differs chiefly in its lobed leaves and the somewhat sharper serration, but the lobes sometimes are very short or nearly obsolete which makes it difficult to separate the two species. Such intermediate specimens are e. g. *K. Ling*, no. 9346, from Shensi, and *Giral-di's* Mt. Mong-hua-san specimen and *Purdom* no. 949 from Shensi, but the slightly lobulate margin, the sharper serration and the glabrous under side refer them to *A. Grosseri*.

In the type specimen the middle lobe of the leaf is broadly triangular-ovate, while in other specimens it becomes elongated and oblong-ovate which gives the leaves a resemblance to those of *A. laxiflorum* Pax, but the latter has the leaves pubescent on the veins of the under side and a sharper and deeper serration.

***Acer Grosseri* var. *Hersii* (Rehd.), comb. nov.—Fig. 8.**

*Acer Hersii* Rehder in Jour. Arnold Arb. III. 217 (1922); VII. 222 (1926); VIII. 163 (1927).—Fang in Contrib. Biol. Lab. Soc. Sci. China, VII. 180 (1932).

*Acer* sp. allied to *A. Grosseri* Bailey, Gent. Herb. I. 35 (1920).

HONAN: Teng-feng-hsien, *J. Hers*, nos. 219 (holotype) and 2780; Tsi-yuan-hsien, *J. Hers*, nos. 1739 and 2800; Kikung-shan, *A. N. Steward*, no. 9768 (in part) Aug. 3, 1925. HUPEH: Kikungshan, *A. N. Steward*, no. 9768 (in part) July 1925; *L. H. Bailey*, June 16, 1917. ANHWEI: Tsin-tai, Chu-kwa-shan, *R. C. Ching*, no. 2789.

This variety differs from the type in the more elongated long-acuminate lateral lobes, most pronounced in *Steward's* no. 9768 from the Kikung-shan, in which the lateral lobes are nearly as long as the middle lobe.

**Acer Metcalfii**, sp. nov.—Fig. 9.

*Acer Davidi* forma *trilobata* Diels in Notizbl. Bot. Gard. Mus. Berlin, xi. 211 (1931).—Fang in Contr. Biol. Lab. Sci. Soc. China, vii. 177 (1932).

Arbor 10-metralis, glaberrima, ramulis laevibus fuscis vel flavescentibus. Folia decidua, subcoriacea, trilobata, basi subcordata, lobis medio et lateralibus caudato-acuminatis acumine basi excepto integro, grosse inaequaliter serrato-dentatis dentibus obtusiusculis, nervis lateralibus

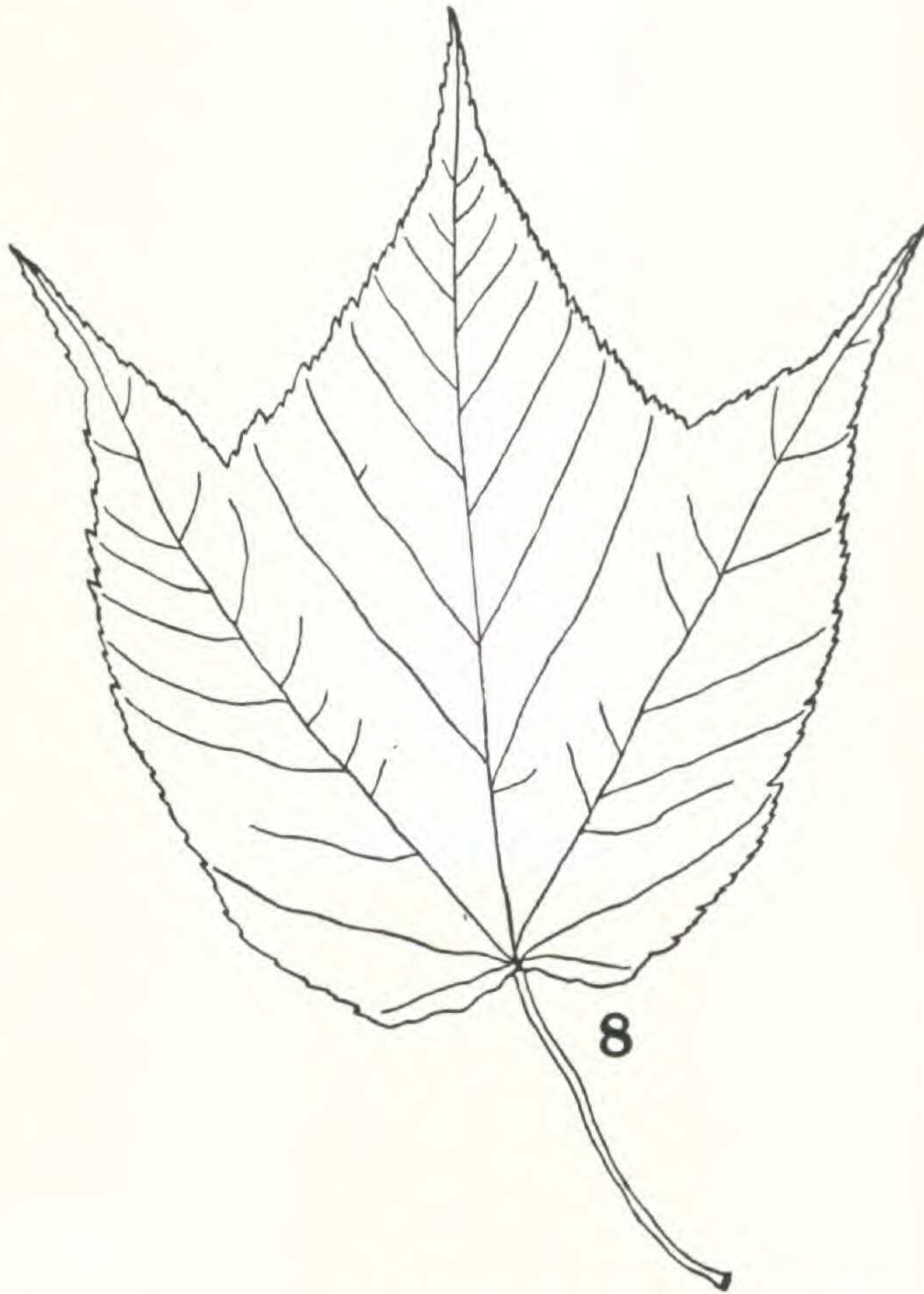


FIG. 8. ACER GROSSERI var. HERSII Rehd.: leaf (2/3 nat. size) from A. N. Steward, no. 9768, Honan.

lobi medii 8-9 in dentes exeuntibus et tantum dentibus duobus vel uno vel nullo inter nervos laterales, utrinque in sicco conspicue reticulata et brunneo-viridia subtus vix pallidiora; petioli circiter 2.5 cm. longi. Flores non visi. Racemi fructiferi 5-6 cm. longi, fructibus 4-6, nuculis compressis nervosis fere horizontalibus circ. 6 mm. longis, alis leviter ascendentibus angulum latum formantibus, nuculo excluso 1.5-2 cm. longis et 6-7 mm. latis.

KWANGTUNG: Lung-tan Mountain, near Iu, Herb. Canton Christ.

Coll. no. 12135, May 22-July 5, 1924 (type). SOUTHERN HUNAN: without precise locality, S. S. Sin, no. 298, May to Aug. 1926.

This new species is closely related to *A. Grosseri* var. *Hersii* Rehd. but is easily distinguished by the subcoriaceous leaves reticulate on both sides remotely and coarsely dentate-serrate with obtusish teeth; between the teeth terminating the lateral veins, there are only one or two or rarely three secondary teeth and none at all toward the apex of the lobes. Of *Acer Davidi* f. *trilobata* I have before me only a photograph

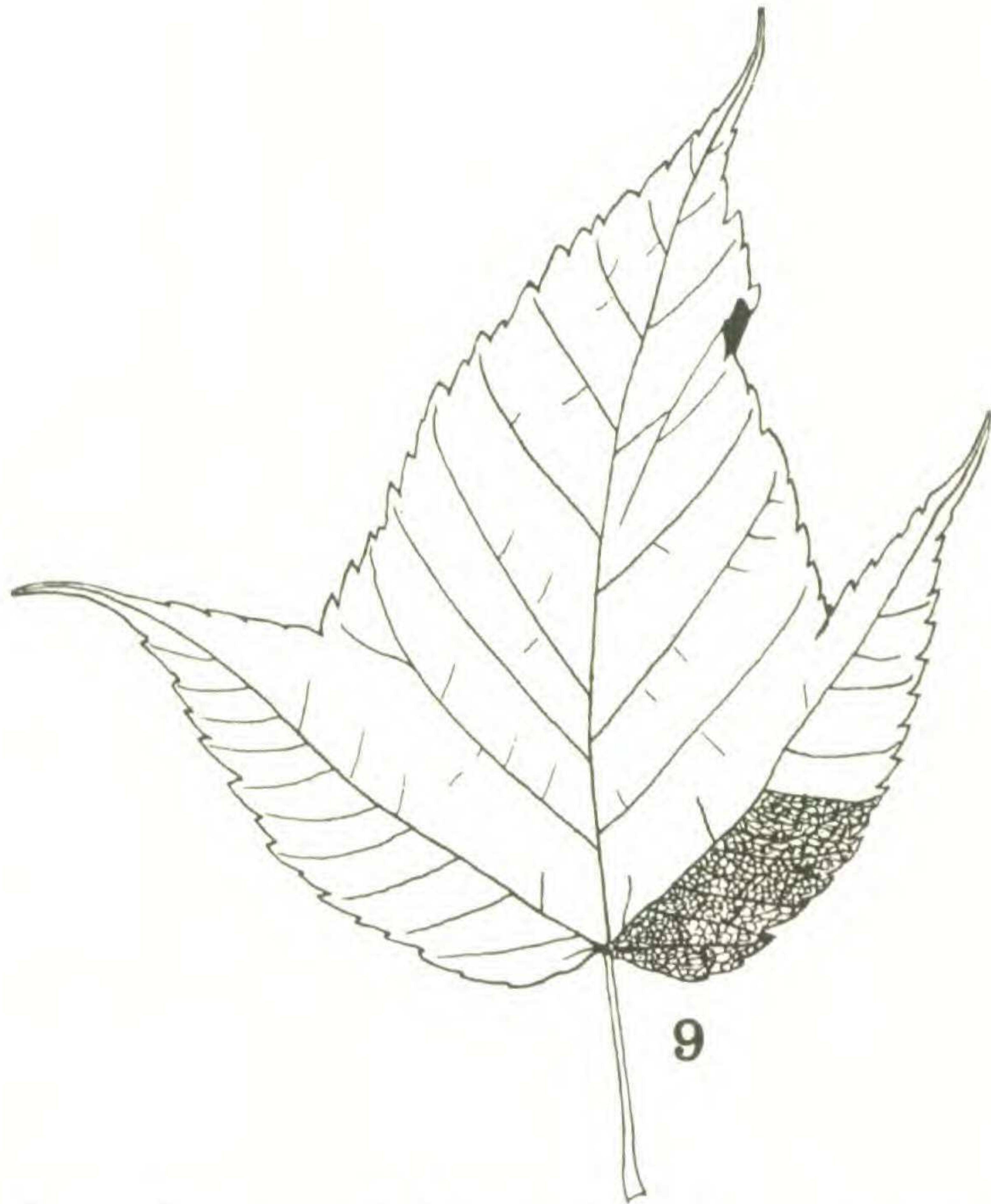


FIG. 9. ACER METCALFII Rehd.: leaf (2/3 nat. size) from Canton Christ. Coll. no. 12135 (holotype).

of the type which shows a serration somewhat less coarse and remote than that of the type of *A. Metcalfi*, but it certainly is referable rather to that species than to *A. Grosseri* var. *Hersii*.

I take pleasure in naming this new species in honor of Dr. F. P. Metcalf, who recognized the specimen as new and marked it thus in this herbarium; his recent paper on the species of the section *Integrifolia* (Lingnan Sci. Jour. XI. 193-210. 1932) is a valuable contribution to the knowledge of the genus *Acer*.